STATEMENT OF WORK
for
Developing a Vegetation Monitoring Plan for the
Northern Great Plains Network

Introduction

The Northern Great Plains Inventory & Monitoring (I&M) Network (Network) of the National Park Service (NPS) consists of 13 NPS units in North and South Dakota, Nebraska, and eastern Wyoming. The Network is in the planning phase of a long-term program to monitor the health of park ecosystems. Over the next two-three years the Network will develop a "Vital Signs"[1] Monitoring Plan (Plan). The Plan will provide background information on park resources, stressors to those resources, current monitoring efforts, a list of potential indicators and the reasons for choosing such indicators, the protocols to be used in monitoring, threshold or trigger levels, and potential management responses. Dr. Amy Symstad of USGS-Biological Resources Divisions (BRD) has agreed to assist in developing the vegetation monitoring component of the Plan. This Statement of Work (SOW) documents the respective roles of BRD and NPS in developing the vegetation component of the Plan.

Background

In 1998 Congress directed the NPS to conduct baseline natural resource inventories and to implement a long-term monitoring program in national park units (National Parks Omnibus Management Act of 1998). Congress' intent was for the agency to monitor the ecological "health" of the parks. To implement the initiative, the NPS delineated 32 networks of parks, one of which is the Northern Great Plains Network (see http://www.nature.nps.gov/im/monitor/networks/networks.htm for more information on the national NPS I&M Program). The park units in the Network are:

Parks of the Northern Great Plains Network

Parks (and their administrative alpha codes)	Acres
Agate Fossil Beds National Monument (AGFO)	3,055
Badlands National Park (BADL)	244,300
Devils Tower National Monument (DETO)	1,360
Fort Laramie National Historic Site (FOLA)	833
Fort Union Trading Post National Historic Site (FOUS)	450
Jewel Cave National Monument (JECA)	1,355
Knife River Indian Villages National Historic Site (KNRI)	1,758
Missouri National Recreation River (MNRR)	33,839
Mount Rushmore National Memorial (MORU)	1,238
Niobrara National Scenic River (NIOB)	21,035
Scotts Bluff National Memorial (SCBL)	3,003
Theodore Roosevelt National Park (THRO)	70,446
Wind Cave National Park (WICA)	28,295

[1] "Vital Signs" is a phrase used by the NPS to describe the agency's monitoring program. Vital Signs are synonymous with ecological indicators. These indicators can be biotic or abiotic. They are measurable and tend to be correlated with, or indicative of, the overall health of a wide group of resources.

The Network is midway through conducting baseline natural resource inventories. Network field projects have focused on vertebrates and vascular plants. Detailed information on these field inventories can be found in the Network's inventory study plan (National Park Service 2002). Abiotic inventories have been conducted at the national level. Information on the national inventory program can be found at http://www1.nature.nps.gov/im/inventory/index.htm .

In fiscal year 2003 the Network received $150,000 in monitoring startup funds. The startup money is intended in part to develop the Plan. In fiscal year 2005 the Network should receive full monitoring funding (approximately $900,000) and begin the process of hiring monitoring staff. Implementation of the Plan may begin as early as 2005, although full implementation will likely occur in 2006. Development of a comprehensive and defensible "Vital Signs" monitoring plan is the Network's highest priority at this time. The Network identified Dr. Amy Symstad has being uniquely qualified to develop the vegetation monitoring component of the Plan.

Goals and Objectives

The **goal of this project is to develop the vegetation monitoring component of the Network's "Vital Signs" monitoring plan by March 30, 2006**. The following objectives constitute the primary project tasks and deliverables.

- Provide a review, synthesis, and assessment of park vegetation, park goals and objectives in regards to those resources, and authorities and policies affecting those resources and park management thereof.
- Provide a review, synthesis, and assessment of vegetation monitoring efforts being conducted by NPS and non-NPS entities in and around Network parks.
- Provide a detailed review, synthesis, and assessment of past, present, and potential future stressors affecting park vegetation.
- Solicit input from park staff, other interested agencies and organizations, subject-matter experts, and experts knowledgeable in the theories, principles, and methods of monitoring vegetation resources.
- Conduct a decision-making process that ranks potential floral indicators and identifies those specific indicators that should be monitored.
- Develop monitoring protocols for selected floral indicators that is scientifically defensible and can be implemented within the logistical, fiscal, and administrative constraints of the I&M Program and Network parks.
- Identify normal limits of variation of selected indicators and thresholds which trigger management actions.
- Identify potential management actions in response to indicators reaching trigger points.
- Work closely with the Network Data Manager to develop GIS databases, tabular databases, statistical analyses, and infrastructure needed to implement a monitoring program.

- Present all of this information in a coherent and complete document that can readily be integrated into a comprehensive monitoring plan following recommended NPS guidelines.

Approach and Methods

Dr. Amy Symstad of USGS-BRD will be the Principle Investigator (PI) on the project. It is anticipated that Dr. Symstad will devote 4-6 months of effort to the project in late 2003 and early 2004, and thereafter assist the Network as needed to refine the vegetation monitoring component of the plan. There are two broad tasks or phases to the project:

Task 1: Collect, review, and assess literature, data, and other information related to park vegetation resources. Review and summarize programs and methods for vegetation monitoring being used in the Northern Great Plains, including programs within NPS (e.g., Fire Effects monitoring, Long-term Ecological Monitoring program, Exotic Plant Management Team), and outside of NPS (e.g., Forest Service monitoring programs). As part of the data mining process the PI should have a meeting at each park with park management and natural resource specialists. The PI should work closely with park staff to identify stressors to park vegetation, park management objectives, and the role of park vegetation in overall park health. Non-NPS plant ecologists shall be consulted as needed.

Task 2: Using the information collected in Task 1, develop a complete list of potential indicators of vegetation health and condition. Clearly describe and justify the potential indicators on the list, and describe some potential approaches to monitoring such indicators, and the potential implications to park management. From the complete list of potential indicators work with park staff, the Network Coordinator, and other subject-matter experts to identify and select a final list of indicators to be monitored at the individual parks. Such a list will need to reconcile park-specific needs and issues against the efficiency of a uniform Network approach. For the selected indicators design monitoring protocols. Such protocols shall include study design and data collection methods, statistical analyses, personnel needed, and project costs. For the selected indicators develop thresholds or exceedence levels that trigger management actions, and identify potential management actions. Present the information in a final report.

Required Meetings

Facilitation and/or participation in the following meetings is critical for success of the project (this shall not be construed as a complete list of all meetings/travel that will occur).

- Conduct a half day meeting with management and natural resource staff from each park and a half day field visit of the park.
- Participate in Network-wide workshops. One such meeting will include interested stakeholders and subject-matter experts. Another such meeting may include only NPS staff and the PI. Other meetings may be required.

Work Schedule

The PI will complete a large portion of the work in late 2003 and early 2004. It is anticipated that a draft or framework for vegetation monitoring will be developed within that period. It is anticipated that regular consultation and discussions will occur between the PI and NPS throughout 2005 and 2006; however, these should not consume significant portions of the PI's time.

Role of NPS in the Project

The project is a collaborative effort between BRD and the NPS, with both contributing to the final products. Indeed, substantial NPS involvement is critical to the success of this project. Specific examples of NPS involvement in this project include:

- The Network Coordinator will play an active role in all aspects of this project. The Network Coordinator will be in regular contact with the PI. The Network Coordinator will attend most meetings and workshops regarding this project. The Network Coordinator has ultimate responsibility and oversight for the project.
- The Network Data Manager will be the repository for data collected as part of this project. The Network Data Manager will assist the PI whenever possible in data management, database design, and data analysis. The Network Data Manager will provide support and assistance in the use of spatial data (i.e., GIS).
- Staff from Network parks will provide substantial input into the collection of background data, significant issues, assessment of the park's resources, and stressors on those resources. Park staff will ultimately be responsible for identifying which indicators will be monitored. Park staff will review all critical documents for accuracy, clarity, and consistency with park operations.
- The Network Coordinator and his or her staff will provide substantial background data. This data includes vegetation maps, park species list, GIS layers, planning documents, copies of studies conducted, examples of monitoring plans from other NPS networks, tools used by other NPS networks to prioritize indicators, monitoring guidance, and other materials. The PI is encouraged to use text from existing NPS documents whenever appropriate.
- The NPS Great Plains Cooperative Ecosystems Studies Unit (CESU) representative will review project reports. The NPS Midwest Region Inventory & Monitoring Coordinator will do likewise.
- The Network will administer and fund all travel expenses incurred by the PI or people working on her behalf in regards to the project.

Products

All products should be delivered to the Network Coordinator. Deliverables for this project include:

- A final report in electronic version, preferably Microsoft Word. The final report shall be in a format suitable for integration into a comprehensive monitoring plan

following the guidance of the Network Coordinator and the national NPS Inventory & Monitoring Program.

Budget

USGS-BRD has agreed to pay for the salary of the PI. NPS has agreed to pay for all travel costs incurred by BRD as a result of the project. Should BRD need additional support or resources, they will confer with the Network Coordinator. NPS will cover all reasonable costs outside of the PI's salary. Due to the nature of this project no fixed budget has been developed.

Literature Cited

National Park Service. 2002. Northern Great Plains Network: Inventories of vascular plants and vertebrates: Study Plan FY2001-2004. National Park Service, Mt. Rushmore National Memorial.

Signatures

We agree to the conditions and spirit of this Statement of Work.

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